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Case 09/864,109

Filed 5/24/2001 we can easily find stuff much earlier

Background

I need some stuff showing the following

1. UNIX the DUMP command and what it normally produces
2. C compiler the -g option on compiling. What it does

All this is background for the invention.

One of the best places is the GNU website.

Give it a couple seconds the protest banner disappears.

3 The actual invention. GNU Unix most likely has a

HOW TO EDIT THE DUMP COMMAND IN GNU UNIX

I need this type of how to instructions.

Todd Ingberg

Primary Examiner

Art Unit 2124

305-9775

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STIC Searcher Terese Esterfeld

Phone 308-7795

Date picked up 4/21/04 11:30am

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# LINUX<sup>®</sup> System Administration

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# STIC Search Report

## EIC 2100

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Location: 5X18  
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Thursday, April 22, 2004

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### Search Notes

Dear Examiner Ingberg,

Attached, please find the results of your search request for application 09/864109. I have concentrated on finding information on UNIX DUMP Command.

I have searched books, the WWW and DIALOG for specific information.

Please let me if you need additional information on this search.

Thank you for coming to EIC 2100.

Terese Esterheld

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When you have set up your file system, you can get all the physical information about your drive by using the `dumpe2fs` command. Its first response is to print the general information that describes the disk.

```
# dumpe2fs /dev/hdb1
Filesystem volume name: <none>
Last mounted on: <not available>
Filesystem UUID: ff58a23c-2d18-11d2-8572-df2853ee15fb
Filesystem magic number: 0xEF53
Filesystem revision #: 0 (original)
Filesystem features: (none)
Filesystem state: not clean
Errors behavior: Continue
Filesystem OS type: Linux
Inode count: 128016
Block count: 512032
Reserved block count: 25601
Free blocks: 482165
Free inodes: 125683
First block: 1
Block size: 1024
Fragment size: 1024
Blocks per group: 8192
Fragments per group: 8192
Inodes per group: 2032
Inode blocks per group: 254
Last mount time: Mon Aug 10 09:35:01 1998
Last write time: Mon Aug 10 17:38:30 1998
Mount count: 11
Maximum mount count: 20
Last checked: Thu Aug 6 03:34:13 1998
Check interval: 15552000 (6 months)
Next check after: Tue Feb 2 02:34:13 1999
Reserved blocks uid: 0 (user root)
Reserved blocks gid: 0 (group root)
```

Next `dumpe2fs` prints the group information; within the groups are sets of blocks and the locations of the inode tables. It also tells you how many directories, free inodes, and blocks you have.

```
Group 0: (Blocks 1 -- 8192)
  Block bitmap at 4 (+3), Inode bitmap at 5 (+4)
  Inode table at 6 (+5)
  6682 free blocks, 2019 free inodes, 2 directories
```

Free blocks: 1511-8192

Free inodes: 14-2032

Group 1: (Blocks 8193 -- 16384)

Block bitmap at 8196 (+3), Inode bitmap at 8197 (+4)

Inode table at 8198 (+5)

7932 free blocks, 2031 free inodes, 1 directories

Free blocks: 8453-16384

Free inodes: 2034-4064

Group 2: (Blocks 16385 -- 24576)

Block bitmap at 16388 (+3), Inode bitmap at 16389 (+4)

Inode table at 16390 (+5)

7932 free blocks, 2031 free inodes, 1 directories

Free blocks: 16645-24576

Free inodes: 4066-6096

Group 3: (Blocks 24577 -- 32768)

Block bitmap at 24580 (+3), Inode bitmap at 24581 (+4)

Inode table at 24582 (+5)

7880 free blocks, 386 free inodes, 1 directories

Free blocks: 24889-32768

Free inodes: 7743-8128

Group 4: (Blocks 32769 -- 40960)

Block bitmap at 32772 (+3), Inode bitmap at 32773 (+4)

Inode table at 32774 (+5)

5206 free blocks, 1952 free inodes, 1 directories

Free blocks: 35165-35172, 35763-40960

Free inodes: 8209-10160

Group 5: (Blocks 40961 -- 49152)

Block bitmap at 40964 (+3), Inode bitmap at 40965 (+4)

Inode table at 40966 (+5)

7237 free blocks, 2027 free inodes, 0 directories

Free blocks: 41220, 41917-49152

Free inodes: 10161, 10167-12192

Group 6: (Blocks 49153 -- 57344)

Block bitmap at 49156 (+3), Inode bitmap at 49157 (+4)

Inode table at 49158 (+5)

7932 free blocks, 2031 free inodes, 1 directories

Free blocks: 49413-57344

Free inodes: 12194-14224

Group 7: (Blocks 57345 -- 65536)

Block bitmap at 57348 (+3), Inode bitmap at 57349 (+4)

Inode table at 57350 (+5)

6308 free blocks, 1928 free inodes, 1 directories

Free blocks: 59229-65536

Free inodes: 14329-16256

Group 8: (Blocks 65537 -- 73728)  
Block bitmap at 65540 (+3), Inode bitmap at 65541 (+4)  
Inode table at 65542 (+5)  
7751 free blocks, 2024 free inodes, 1 directories  
Free blocks: 65959-65974, 65994-73728  
Free inodes: 16263, 16266-18288

Group 9: (Blocks 73729 -- 81920)  
Block bitmap at 73732 (+3), Inode bitmap at 73733 (+4)  
Inode table at 73734 (+5)  
7908 free blocks, 2028 free inodes, 1 directories  
Free blocks: 74013-81920  
Free inodes: 18293-20320

Group 10: (Blocks 81921 -- 90112)  
Block bitmap at 81924 (+3), Inode bitmap at 81925 (+4)  
Inode table at 81926 (+5)  
7927 free blocks, 2026 free inodes, 1 directories  
Free blocks: 82186-90112  
Free inodes: 20327-22352

Group 11: (Blocks 90113 -- 98304)  
Block bitmap at 90116 (+3), Inode bitmap at 90117 (+4)  
Inode table at 90118 (+5)  
7932 free blocks, 2031 free inodes, 1 directories  
Free blocks: 90373-98304  
Free inodes: 22354-24384

Group 12: (Blocks 98305 -- 106496)  
Block bitmap at 98308 (+3), Inode bitmap at 98309 (+4)  
Inode table at 98310 (+5)  
6294 free blocks, 1993 free inodes, 1 directories  
Free blocks: 100203-106496  
Free inodes: 24424-26416

Group 13: (Blocks 106497 -- 114688)  
Block bitmap at 106500 (+3), Inode bitmap at 106501 (+4)  
Inode table at 106502 (+5)  
7932 free blocks, 2031 free inodes, 1 directories  
Free blocks: 106757-114688  
Free inodes: 26418-28448

To check the disk integrity, use the command `e2fsck`. This will tell you if your partition is clean or if your partitions are non-contiguous.

```
# e2fsck /dev/hda1
```

Another useful tool to use is `tune2fs`. This enables you to tune your file system. You can change the response to errors (continue, mount as read-only, or kernel panic), set the volume label and any other parameter that could be created with `mke2fs`. However, you are playing with a live file system. Be aware that you can cause some drastic and possibly unwanted results.



Do NOT run `e2fsck` or `tune2fs` on a read-writable mounted partition! Before using `e2fsck` or `tune2fs`, make sure you backup the data on the disk and unmount the partition. Keep in mind you are changing the configuration of the disk itself, and you may lose your data.

## Links

Two types of links are available in your Linux system: *hard* and *symbolic* (also called a *soft link* or *symlink*). Inodes play a large part in the functioning of both types. A *link* is a way to "nickname" a file; you can refer to the same file with more than one name. The following listing depicts a file called `inodes`, a symlink, and a hardlink.

```
$ ls -li
total 11
93475 -rw-r--r-- 1 stripes users      52 Aug  6 17:06 diskstuff
93474 -rw-r--r-- 2 stripes users    3470 Aug  6 19:06 hardlink
93474 -rw-r--r-- 2 stripes users    3470 Aug  6 19:06 inodes
95505 drwxr-xr-x 2 stripes users    1024 Aug  6 17:06 moreinfo
99569 drwxr-xr-x 2 stripes users    1024 Aug  6 17:07 morestuff
93476 lrwxrwxrwx 1 stripes users       6 Aug  6 17:36 symlink -> inodes
```

## HARD LINKS

A hard link points to the inode of a file. From the following listing, you can see both `hardlink` and `inodes` have the same inode, or index number (93474). Also, you can see they both have the same time (19:06) and block size (3470).

```
$ ls h* i*
93474 -rw-r--r-- 2 stripes users    3470 Aug  6 19:06 hardlink
93474 -rw-r--r-- 2 stripes users    3470 Aug  6 19:06 inodes
```

To create a hard link, just issue the command `ln`.

```
$ ln file hardlink
```

u if your



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## System Administrator's Edition

*Robin Burk and David B. Horvath, CCP, et al.*

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# UNLEASHED

*To Stephen P. Kowalchuk, who provided an IS manager and practicing network administrator's point of view.*

*—Robin Burk*

*This edition is dedicated to my parents and grandparents. Education and doing one's best were always important to them.*

*—David B. Horvath*

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## Using the dump Command

The dump command essentially has the same functionality as the tar command, with the exception that it is somewhat more rigorous than tar. With dump, you can back up an entire file system or specified files and directories in a file system. In addition, you can specify a "dump level" (priority for saving files) to indicate the currency (last modification time) of the files to be backed up.

For example, if a level 2 dump is done on one day and a level 4 dump is done on the following day, only the files that have been modified or added since the level 2 dump will be backed up to the level 4 dump. The date and level of prior dumps are listed in the file `/etc/dumpdates`. Dump uses this file as a reference to decide which files to back up. If a dump command is not successful, it will not update this file.

Used in conjunction with the system scheduler (cron), this can be an effective solution for continuous system backups and archives.

In general, dump is used in the following format:

```
/usr/etc/dump [options [arguments]] filesystem
```

A typical example of this command would be the following,

```
/usr/etc/dump /dev/nrst0 /dev/sd0h
```

where `/dev/nrst0` is the no-rewind tape device file and `/dev/sd0h` is the file system device file of the file system to be backed up. You must get the file system device filename from the output of `df`, cross-referenced with the appropriate directory. This example was taken from a Sun system.

In addition to dumping file systems, you can dump specific files. However, if you choose to do this, you can only back up files at level 0. As a matter of fact, the `/etc/dumpdates` file is never even used, even if you choose the `-u` option.

As an example, let's say we want to dump the files `chapter1` and `chapter2` to an 8mm tape drive. The command would look something like this:

```
dump fdsb /dev/rst0 5400 6000 126 chapter1 chapter2
```

Consult the man pages for more information on the options available for each particular tape drive.

## Using cpio

One of the more popular generic backup utilities in use today is the `cpio` command. In large part, its popularity is due to its capability to append backup volumes and span tapes, allowing you to create incremental backup sets and full systems backups without losing data integrity.

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